

**ABSTRACT**

A CMOS Active Pixel Sensor (APS) uses a pinned photodiode as a photoreceptor and negative-channel metal-oxide semiconductor (NMOS) transistors in the sample and hold and reset circuits of the frame shutter. The pinned photodiode increases the quantum efficiency and reduces the dark current. The NMOS transistors in the frame shutter increase the fill factor and reduce the pixel pitch.

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